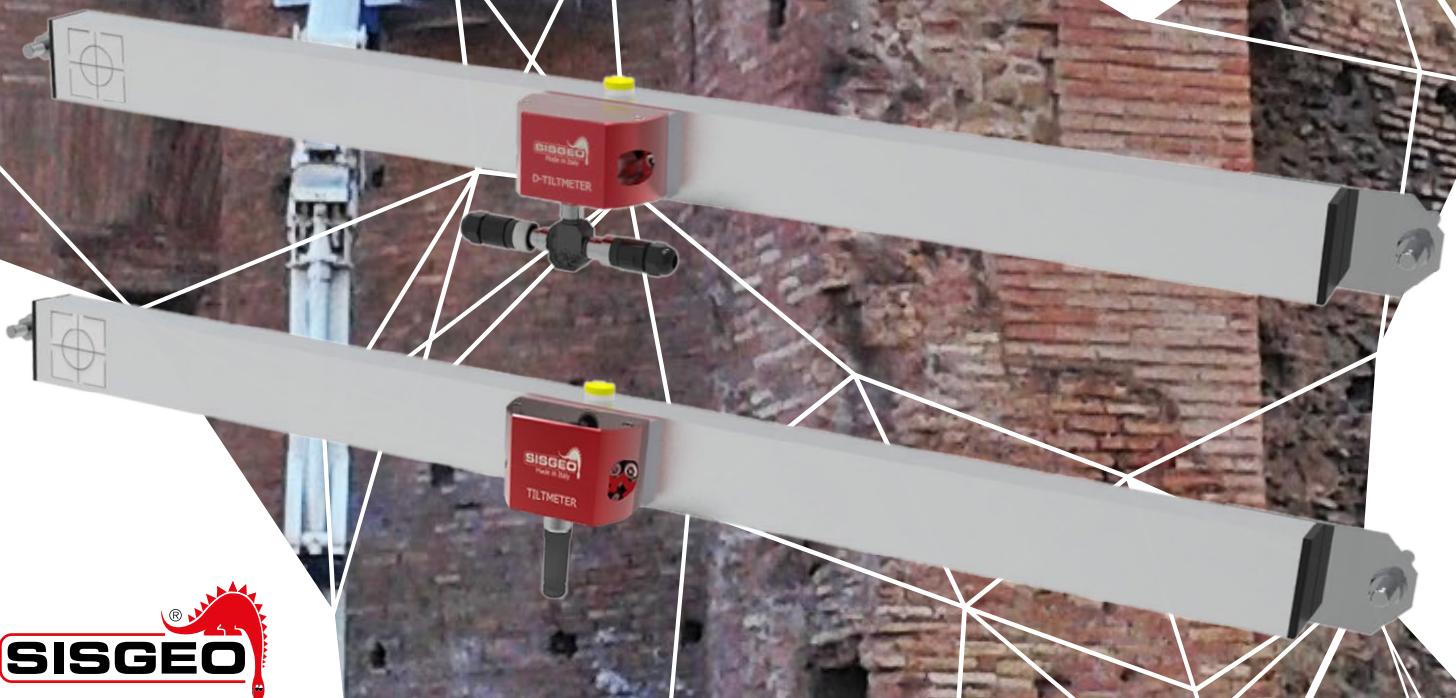
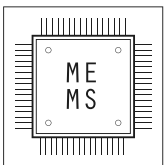


S700

# TILT BEAM SENSORS

INCLINOMETERS  
& PENDULUMS





## TILT BEAM SENSORS

Tilt Beam (TB) sensor consists of a MEMS tiltmeter mounted on a rigid aluminium beam with a defined gauge length, typically 1, 2 or 3 meters. Tilt meters shall be mounted on the beams at site and are available in digital and analogue version, with uniaxial or biaxial sensor.

TB most common application is horizontal chain on structures in order to monitor differential settlements or heaves. TB can be also installed horizontally, vertically or inclined, in chains or in stand alone installations.

Thanks to the sensor fixing and adjustment plate, they could be utilized to monitor every tilting or displacement in a large number of applications.

### APPLICATIONS

- Structures
- Diaphragm walls
- Dams
- Tunneling
- Deep excavations
- Unstable slopes

### FEATURES

- Removable and modular system for multiple installation
- Simple and fast installation through connectors (digital version)
- Inclined installation allowed
- Nearly real-time monitoring with OMNIAlog and miniOMNIAlog

 *Meet the essential requirements of the EMC Directive 2014/30/UE*

## TILT METERS SPECIFICATIONS

PRODUCT CODES	0S541MA0000	0S542MA0000	0S541HD0000	0S542HD0000
Measurement principle	self-compensated MEMS inclinometer		self-compensated MEMS inclinometer	
Measuring range <sup>(1)</sup>	±2.5°, ±5°, ±10°		±2.5°, ±5°, ±10°	
Sensor resolution (reading frequency 2 Hz)	0.001°		0.00056°	
Sensor mechanical bandwidth	18 Hz		18 Hz	
Stability @ 30 days <sup>(2)</sup>	<0.008°		<0.007°	
Sensitivity <sup>(3)</sup>	see Calibration Report		see Calibration Report	
Accuracy:				
Pol. MPE <sup>(4)</sup>	±0.004° for ±2.5° range ±0.006° for ±5° range ±0.010° for ±10° range		±0.002°	
Lin. MPE <sup>(4)</sup>	±0.008° for ±2.5° range ±0.012° for ±5° range ±0.020° FS for ±10° range		±0.004°	
Offset temperature dependency (from -20°C to +70°C)	±0.003° / °C		±0.002° / °C	
Power supply	from 18 to 30 Vdc		from 8 to 28 Vdc	
Signal output and protocol	4-20 mA current loop (inclination), Ohm (temperature)		RS485, Modbus RTU <sup>(5)</sup>	
A/D converter			32 bit, precision 38-kSPS	
Average consumption	max 20 mA per Axis		Uniaxial sensor: 4.3 mA @ 24 Vdc, 8.0 mA @ 12 Vdc Biaxial sensor: 5.3 mA @ 24 Vdc, 10.0 mA @ 12 Vdc	
Temperature operating range	from -30°C to +70°C		from -30°C to +70°C	
Internal temperature sensor:	NTC 3 kΩ Thermistor		Embedded on electronic board	
- measuring range	from -50°C to +150°C		- 40°C to +125°C	
- accuracy (resolution)	±0.5 °C (0 to +50°C)		±1°C with temperature range -10°C to +85°C (res. 0.01 °C)	
Internal humidity sensor: <sup>(6)</sup>	-		Embedded on electronic board	
- measuring range			0 to 100% RH	
- accuracy (resolution)			±5% RH with humidity range 0 to 95% RH (res. 0.025% RH)	
On-board supply voltage monitor: <sup>(6)</sup>	-		Embedded on electronic board	
- measuring range			0 to 36 V	
- accuracy (resolution)			±5% FS (res. 0.01 V)	
Signal cable	OWE106IP0ZH		OWE106IP0ZH	
Cabling	M12 male 8-pin connector on sensor body		M12 male connector on sensor body, 3-port T-shaped splitter for cable wiring	
Max. cable length to logger	1000 m (for more information see <a href="#">FAQ #073</a> ) <sup>(7)</sup>		1000 m (for more information see <a href="#">FAQ #073</a> ) <sup>(7)</sup>	

(1) Other ranges available on request

(2) Stability calculated as difference after 30 days under repeatability conditions.

(3) Sensitivity is a specific parameter different for every gauge. The sensitivity is calculated during gauge calibration test and inserted into the Calibration Report.

(4) MPE is the Maximum Permitted Error on the measuring range (FSR). In the Calibration Report, the accuracies of the gauge are calculated using both linear regression (≤ Lin. MPE) and polynomial correction (≤ Pol. MPE)

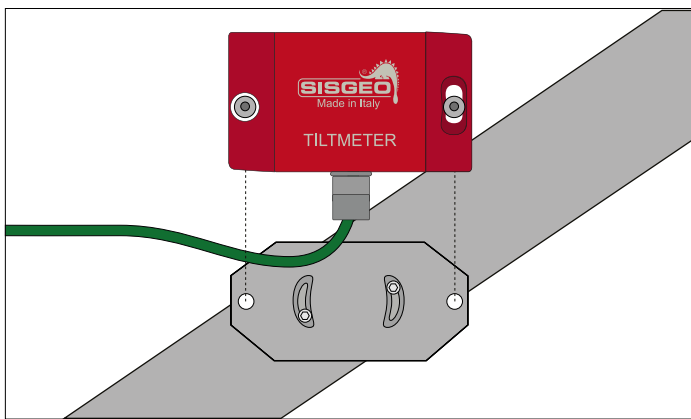
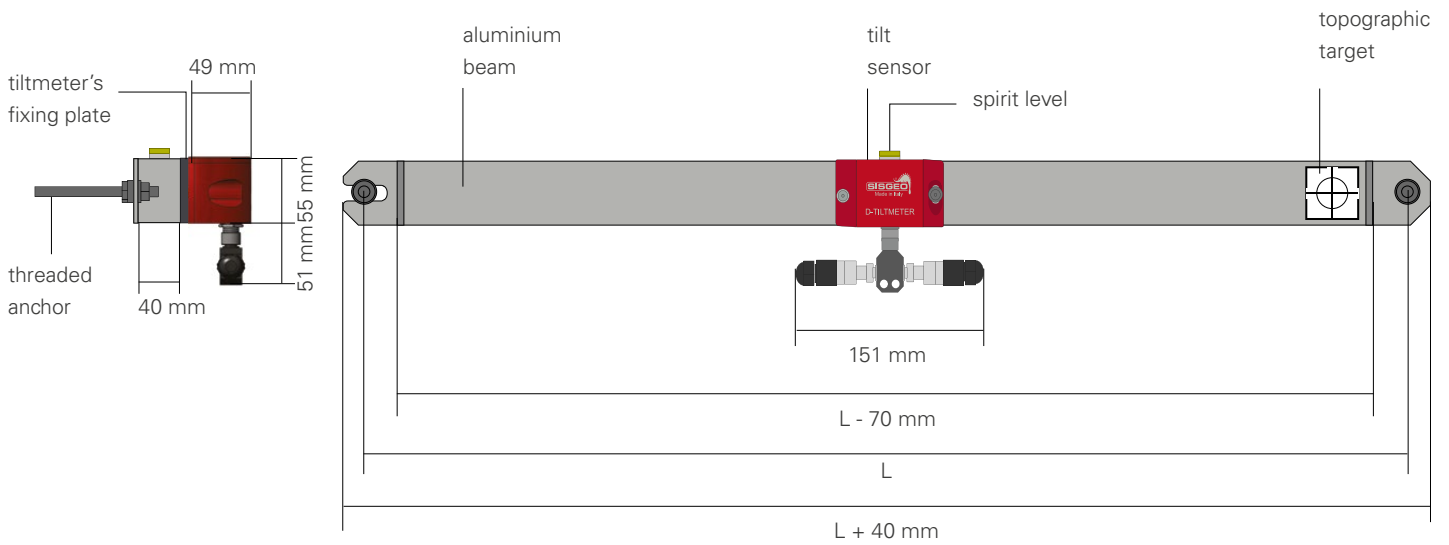
(5) RS485 not-optoisolated Modbus communication with RTU Protocol. Default output is sen , other units available are degree, mm/m and inch/feet (to be requested at order). Sisgeo Modbus protocol manual is available for download at this page.

(6) These sensors are installed on the internal electronic board to give information in the event of probe malfunction.

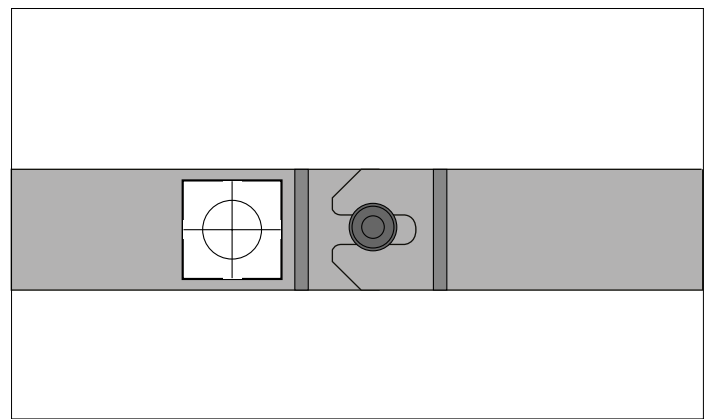
(7) Refer to FAQ section on Sisgeo website: [www.sisgeo.com/faq](http://www.sisgeo.com/faq)

## PHYSICAL FEATURES

	BEAM	TILT SENSOR
Length	1000, 2000 or 3000 mm (L)	99 mm
Width	44 mm	49 mm
Height	60 mm	55 mm
Material	aluminium	anodized aluminum



Connection detail of analogue tilt sensor on beam trough the fixing and adjustment plate.



Detail of beam mechanical connection

## ACCESSORIES AND SPARE PARTS

### ALUMINIUM BEAM OS7BM000002

Aluminium beam for both analogue or digital sensors, available in different length: 1000, 2000 or 3000 mm. Supplied with topographic target, wall mounting supports at the ends and anchor bolts.

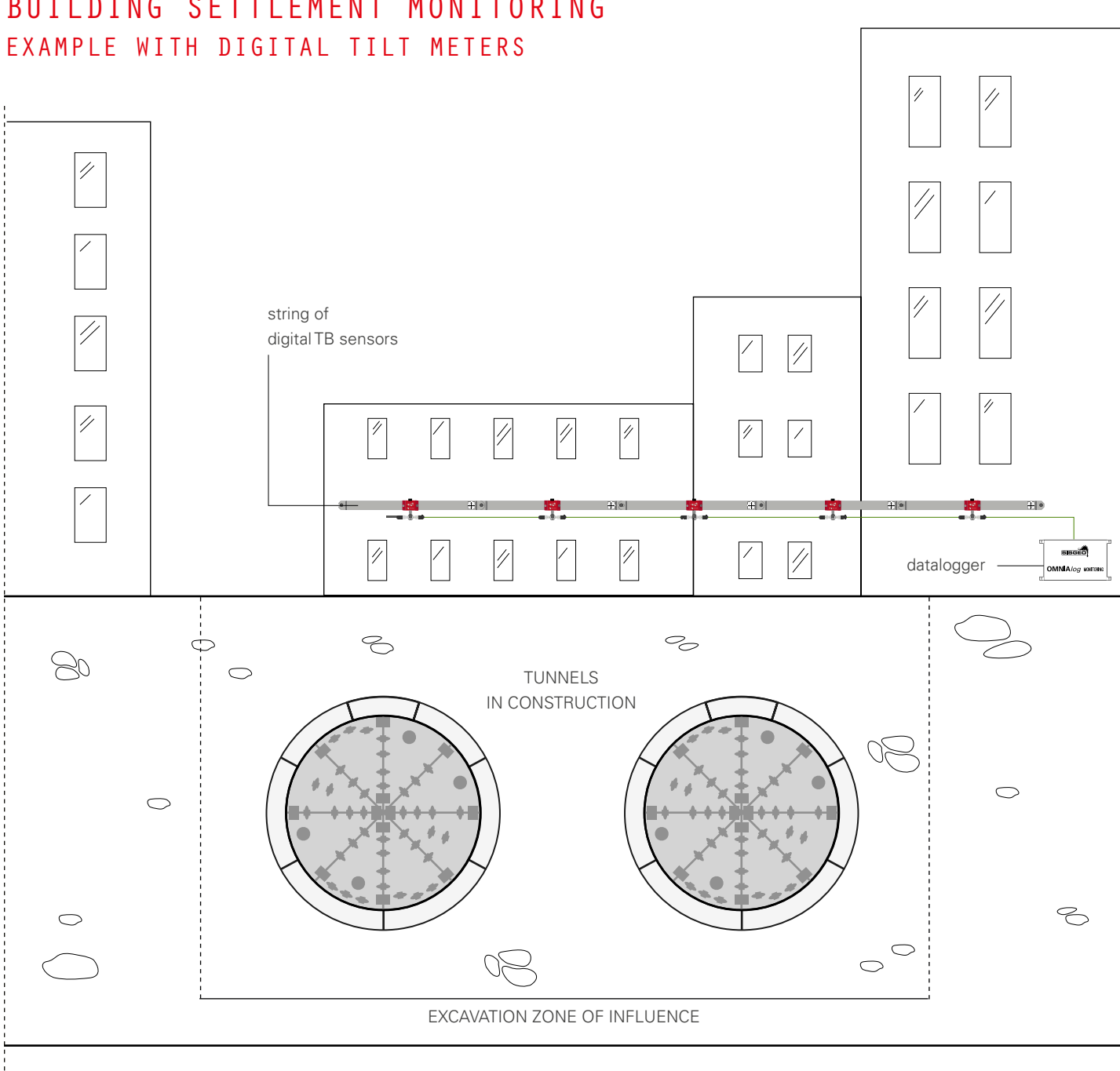
### "L" MOUNTING PLATE OS7BM80SUPO

"L" shaped, floor mounting bracket for horizontal digital beam installation, realized in galvanized steel. Customized brackets for inclined analogue beam sensors available on request.

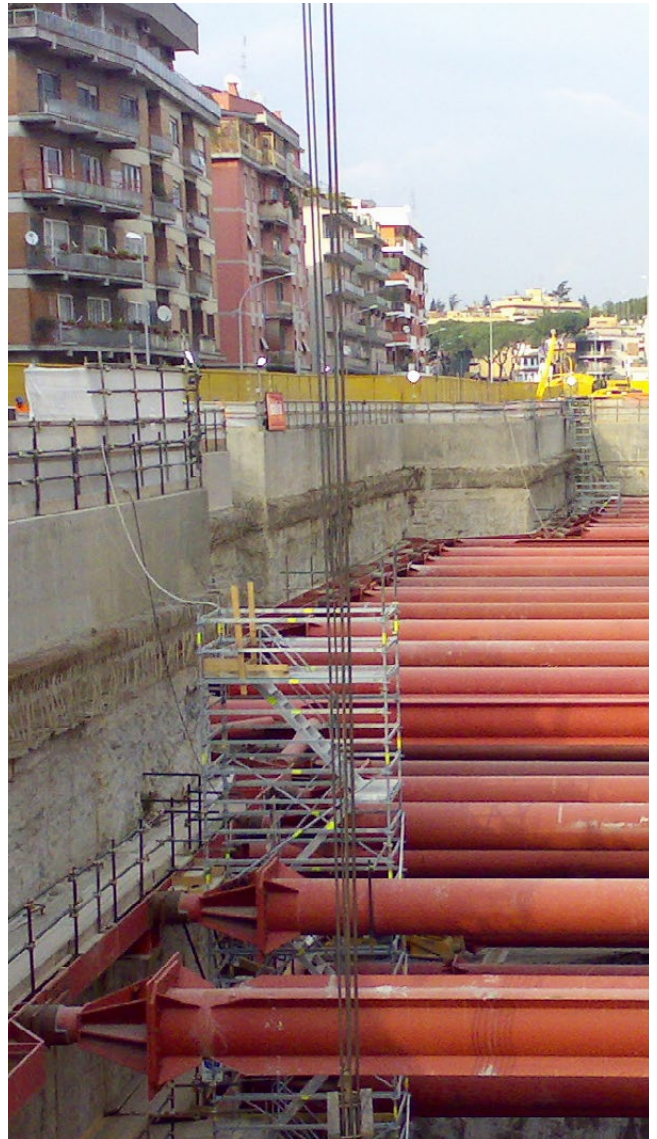
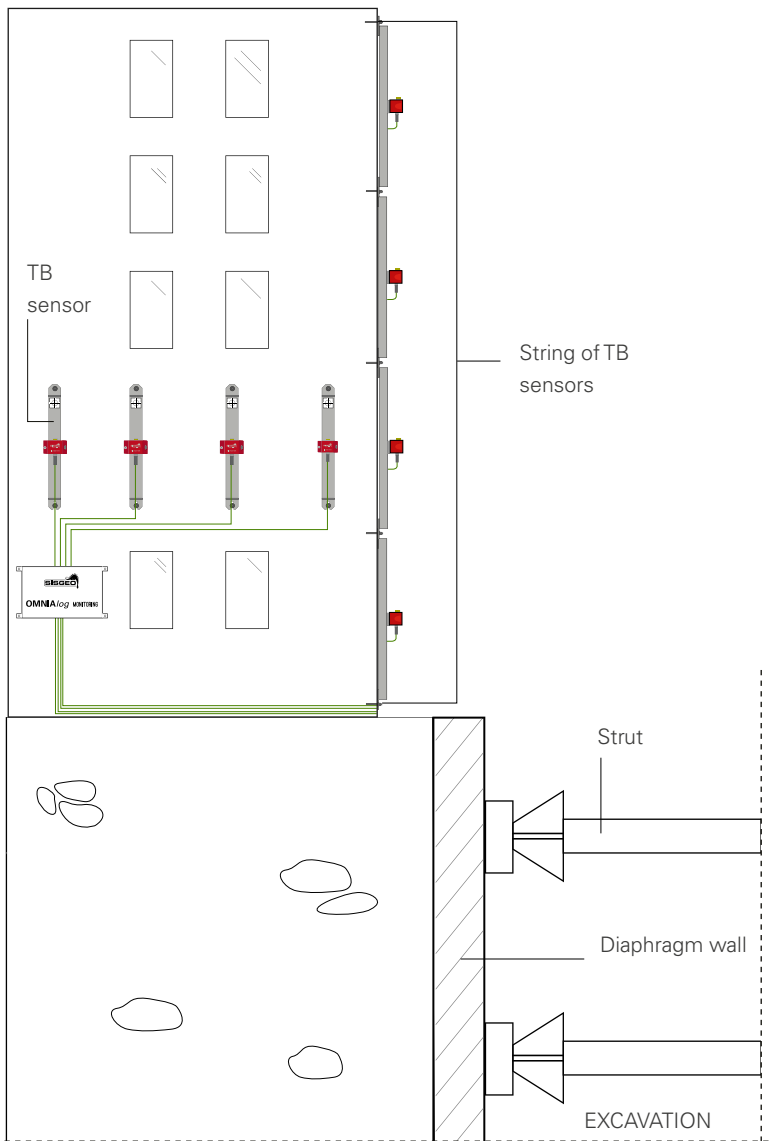
### TERMINATION RESISTANCE OETERMRESIO

Resistance ending device with connector, needed to close every digital tilt meter chain. The value of resistor depends on the layout of each monitoring system. For more detail see [FAQ#076](#).

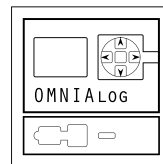
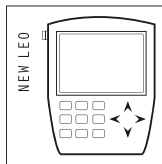
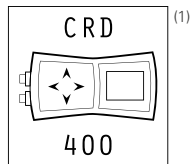
## BUILDING SETTLEMENT MONITORING EXAMPLE WITH DIGITAL TILT METERS



**STRUCTURAL TILT/CANT MONITORING  
EXAMPLE WITH ANALOGUE TILT METERS**



**READABLE BY**



(1) Only for analogue version (mod. S541MA & S542MA)

For further information refer to their own datasheets

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**ADDITIONAL SUPPORT**

SISGEO offers on-line assistance service to the Customers in order to maximize the performance of the system and training on the correct use of the instrument/readout.

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